

TITTLE OF THE INVENTION

Level Lift Trailer with Detachable Cargo Bed

REFERENCE TO RELATED APPLICATIONS

Tilt able Moving Pivoting Bed

Lisota	2,485,300	Tilt moving bed Truck	214/85
LaMora	5,460,473	Dual tilt bed container Trailer	414/494
Celli	4,685,855	Trailer tilt frame / raise bed	414/482
Koller	5,059,085	Trailer w/ dual tilt bed	414/482
Reed	6,149,369	Trailer with part of bed tilting	414/480
Dixon	6,099,232	P U w/ tilt bed detach cargo tray	414/494

Platform Held by Cam Mid Pivoting Links

Pihlstrom	4,930,799	Trailer w/ tilt w/ detach frame	280/400
Saulce	6,113,130	Tire on cam link, Trailer	280/656
Page	5,035,462	Pick Up w/ cam link in bed	296/183
Schramm	2,905,481	Manual opr level lift trailer	280/43.18
Raven	2,230,014	Trailer w/ cams to lift platform	254/8
Verschage	4,372,572	Heavy Trailer w/ cams to lift platf	280/423B

Platform Held by Corner Pivoting Links

Behr	5,536,131	2 wheel trailer, Links w/ winch	414/495
Zinno	4,461,609	Wheel chair car, Links w/ cyl	414/495

Vertical Lift Telescoping Corner Guides

Sobina	5,630,693	Trailer, 4 wheel, w/ 4 lift cyl	414/495
Chown	GB 2,190,349A	2 wheel trailer, w/ 2 lift cyl	

Tracks

Shiels	4,673,328	Pivoting Tracks, Lift / Tilt Trailer	414/471
Stringer	6,273,435 B1	Fixed Tracks, Level Lift	280/6.151
Harris	5,288,197	Fork Lift carrier w/ tracks links	414/495

BACKGROUND OF THE INVENTION

1. THE FIELD OF THE INVENTION

The present invention pertains generally to the field of hauling cargo on highways with motor vehicles and more specifically to cargo carried with trailers.

2. DESCRIPTION OF THE PRIOR ART

Traditionally loads have been carried on a bed above the chassis frame and tires. All such situations require lifting the cargo onto the hauling bed. Many early designs have sought to ease this task. Lisota in US 2,485,300 uses a tilting and moving bed to load or unload a truck. Refinements of this method are used to move the large cargo containers on truck chassis. LaMoria in US 5,460,473 shows this system using a trailer to haul two ocean or train containers. On a smaller scale Dixon in US 6,099,232 loads a small cargo bed into a pick up truck. Although these methods are in wide use today, they are not practical for unpacked cargo, nor can they be used to load or unload alive animals.

Using a system of cams and links, Haven in US 2,230,014 describes a lifting/ lowering trailer. Verschage in US 4,372,572 uses cams, links and hydraulic cylinders to lift heavy loads, such as fork lifts. A level lift trailer bed is kept in alignment by inner sliding telescoping guides as it is lifted by four corner hydraulic cylinders in a design by Sobina in US 5,630,693. In each of these devices, the cargo or load carrying member is a permanent integral part of the trailer.

Adding versatility to his tilting frame trailer, Pihlstrom in US 4,930,799 is able to interchange the cargo carrier. But, this system can not lift a loaded cargo carrier.

Therefore, there is a strong desire for a simple reliable heavy capacity level lift trailer system, capable of detaching from its cargo bed, or from an interchangeable bed in some other various configuration

BRIEF SUMMARY OF THE INVENTION

The present invention is directed to a heavy level lift trailer system in which its cargo is always level with the ground, weather it is being raised into transport position or being lowered to the ground. The same design is applicable to light systems as well.

A further novel feature of the invention is the ability of the cargo bed to release from the trailer. Therefore the cargo bed can always be loaded and its load tied down while sitting on the ground detached from the trailer. Now, a single trailer can move multiple cargo beds weather loaded or unloaded. This system feature uniquely suites the delivery process of manufacturers and the construction industry. The cargo beds need not all be the same, one delivery might be a load of wood, and the next a lockable multi door tool crib attached to saw table and stock rack.

Accordingly, it is another object of the present invention to provide for the safe and easy transportation of live cargo such as horses. Ground level loading and unloading of horses, removes all of the danger and risk of injury to these animals.

It is yet a further object of this present invention to provide an alternate design which may be incorporated into specialized systems for use where very high theft potential prevails. The novel transport and release trailer feature allows for an inexpensive single axel sized custom cargo bed to be used where the equipment must be left unattended for extended periods of time. Thus, the trailer with its tires and wheels is never exposed.

To these ends, the level lift trailer with the option of multiple detachable cargo beds in the present invention, compromises a complete safe and economical cargo transfer or delivery system.

These and other objects, features, aspects, and advantages of the present invention will become better understood with reference to the following description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of the lift trailer of the present invention with a cargo bed lowered and partially removed.

Fig. 2 is a side view of a cargo bed.

Fig. 3 is a front end view of a cargo bed.

Fig. 4 is a plan view of a lift trailer without a cargo bed.

Fig. 5 is a back end view of the trailer without a cargo bed.

Fig. 6 is a sectional view taken on line 10 – 10 of Fig. 4.

Fig. 7 is a sectional view taken on line 20 – 20 of Fig. 4.

Fig. 8 is a partial plan view of a lift trailer with a cargo bed lowered to ground level.

Fig. 9 is an elevational sectional view of the trailer of the present invention taken on line 30 – 30 of Fig. 8 with a cargo bed lowered to ground level.

Fig. 10 is an enlarged sectional view taken on line 40 – 40 of Fig. 9.

Fig. 11 is an enlarged sectional view taken on line 50 – 50 of Fig. 9.

Fig. 12 is an elevational sectional view of the trailer of the present invention with a cargo bed raised to a transport position.

Fig. 13 is an enlarged sectional view taken on line 60 – 60 of Fig. 12.

Fig. 14 a is a perspective view of an alternate portable highway traffic light.

Fig. 14 b is a perspective view of an alternate enclosed cargo box.

Fig. 14 c is a perspective view of an alternate ground level loading horse compartment.

Fig. 14 d is a perspective view of an alternate dumping cargo bed.

Fig. 14 e is a perspective view of an alternate traffic speed sign.

Fig. 14 f is a perspective view of an alternate open cargo platform with castered wheels.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

Referring to the drawings, FIG. 1 shows in perspective view the trailer system 1 of the preferred embodiment of the present invention, showing a trailer assembly 2 and a cargo bed assembly 3 sitting on the ground 4, partially detached from said trailer 2. The cargo space is defined by bed 5, side walls 6, head end 8, and ramp 7. Two inclined channel tracks 12 angled substantially at 45 degrees are disposed to the outside corners of the side walls 6 at the head end 8 and two additional inclined channel tracks 13 angled substantially parallel are disposed to the outsides of the side walls 6 at the opposite open end of said cargo bed. Said channel tracks are sized for the trailer lift rollers 34 and 35.

FIG. 2 shows yet another novel feature of the present invention, horizontal channel extensions 14 and 15 are disposed to said cargo bed sides 6, purposed to receive and guide lift rollers from the head end 8 of the cargo bed and extending to the upper ends of said angled lift channels.

FIG. 3 shows the head end 8 of the cargo bed and the horizontal channel extensions 14 and 15 on both sides 6 of said cargo bed.

Now, turning to FIG. 4 yet another feature of the present invention is shown. The tongue 23 attaches to an end structure 24 and disposes side structure beams 17 / 21 and 18 / 22 separated by an open space 16. Lift rollers are disposed to the opposite inside edges of said side structure beams, the front rollers 35 are mounted vertically lower than the rear rollers 34. The package engine, hydraulic pump, reservoir and valve are mounted at space 36.

Looking into the open back end of trailer 2, in FIG. 5, the front rollers 35 are mounted vertically lower than the rear rollers 34, both into the open space 16. FIG. 6 and FIG. 7 show that the quarter axels 25, the leaf springs 32, and their brackets 33 fit under said side structure beams to maintain the open space 16. Quarter axels 25 are fitted with pivot tubes 26 which are journaled to said side structure beams to preserve alignment of the tires 28 mounted on break spindles 27 attached at the opposite end of said quarter axels.

FIG. 8 shows the location of section line 30 – 30 through said rollers and said angled lift channels. FIG. 9 is that section drawing with the bed sitting on the ground 4.

Attaching to the tongue 23, hydraulic cylinder 37 is extended to full stroke attaching to the cargo bed 3 at bed fitting 38.

FIG. 10 shows roller 34 attached to side structure 17 / 21 while engaged in horizontal extension 15 mounted on side wall 6.

FIG. 12 is an elevational sectional view of trailer 2 of the present invention with cargo bed 3 raised to a transport position with clearance 39 to the ground. Hydraulic cylinder 37 is in retracted position, attaching to the cargo bed 3 at bed fitting 38.

FIG. 11 is an enlarged section of an open lock, assembly 41 mounted on inclined channel track 12 with spring loaded lock pin 42 latched open on hook 43.

Now, turning to a closed lock, FIG. 12 is an enlarged section of the raised cargo bed 3 with front roller 35 in the inclined channel track 12 with spring loaded lock pin 42 latched through the channel, thus holding the cargo bed 3 up without depending on hydraulic pressure on the cylinder 37.

Alternate designs for cargo beds are shown in the following perspective views:

Fig. 14 a is a portable highway traffic light.

Fig. 14 b is an enclosed cargo box with multiple doors and cabinets.

Fig. 14 c is a ground level loading horse compartment.

Fig. 14 d is a dumping cargo bed.

Fig. 14 e is a traffic speed sign.

Fig. 14 f is an open cargo platform with tie down loops and castered non-highway wheels, for ease of movement around the shop.

Although a preferred embodiment has been shown and described, it will be apparent to those skilled in the art that many changes and modifications may be made without departing from the spirit and scope of the present invention.

What is claimed is: